

Chapter 6

FIELD SAMPLING OVERSIGHT ON HAZARDOUS, TOXIC AND RADIOACTIVE WASTE PROJECTS

6-1. Introduction. QA of field sampling activities requires oversight of the various work elements involved. During implementation of sampling activities, field oversight assures that approved methods and procedures are used to perform the work. Data generated for all projects must be of known quality and should also be technically and legally defensible. The necessity for and frequency of field sampling oversight should be addressed during project planning when the scope and objectives of the proposed task are documented. Prior to the initiation of any field sampling activities, the USACE technical staff must approve all sampling and analytical protocols for technical adequacy to ensure field teams will collect samples properly during the field sampling activities. Oversight applies to both contract and in-house executed field sampling activities for any project phase.

6-2. Field Audit Checklists. Field audit checklists are useful tools for USACE technical personnel to conduct and document that approved protocols are being followed. Checklists for various field sampling activities are presented in Figures 6-1 through 6-8. The approved SAP, along with the field audit checklists, should be used as the basis for conducting field sampling oversight.

6-3. Sources of Error. Analytical procedures are often targeted as the main source of error in data analysis, but generally only represent a minimal contribution to the total error. Field errors are often the major source of error. Potential sources of field error are sample collection, sample handling, transport, preparation, preservation, and ID. The district project chemist should routinely communicate with the on-site QC personnel regarding these activities. The sampling portion of any data collection effort has historically been the most difficult in which to assess data quality. The chemist can provide QC for the bottles, reagents, and analyses, but it is difficult to provide QC measures for sample collection. Oversight provides a check on whether or not all the planning steps have been and project objectives are being implemented.

6-4. Frequency and Duration. The frequency and duration of oversight visits should be determined by the project technical team to ensure quality work and attainment of DQOs. The number of site visits and level of scrutiny will depend on the nature, length and complexity of the project, as well as past performance of the sampling team and the intended use of the data. Oversight of field sampling activities should be carried out on both an announced and unannounced basis. Although possibly predictable, oversight during the first stages of a field event and during sampling of critical locations or sample media should be a priority.

6-5. Feedback and Corrective Action. Feedback and corrective action, if appropriate, are the desired outcomes of the field sampling oversight. Feedback should be provided in written form

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to the district representative or contracting officer's representative. For immediate correction of a problem, verbal feedback is acceptable followed by documentation for the file. Problems observed in the field should be identified and reported to the TM or contracting officer's representative for immediate resolution. The contractor should provide a written response of the completed corrective action to the TM or contracting officer's representative for the permanent project file. The checklists as well as the corrective actions should be placed in the project file. Unless empowered by the contracting officer's representative, or the district representative, or unless a condition is observed in the field which compromises personnel health and safety, all oversight findings requiring action should be routed through the district representative and not directly to the contractor by the field oversight personnel.

6-6. Documentation. Documentation of field sampling oversight is recommended for all projects. At a minimum, a report should be filed for any field sampling oversight conducted by USACE personnel. The report should include 1) all deficiencies or problems noted during the course of the oversight; 2) discussions held with the prime contractor and any corrective actions taken; 3) items that require follow-up action by the USACE or prime contractor; 4) unresolved questions from the prime contractor, the customer, and the USACE oversight personnel; 5) health and safety protocols and level of protection used; 6) general quality of the work observed; and 7) overall adherence to the approved work plans. Field sampling oversight is strongly recommended. The applicable manager should be encouraged to support this QA objective through funding and schedule coordination with the appropriate technical personnel.

Field Oversight Checklist - General Procedures

Project Name _____
Address _____
Facility Contact & Phone Number _____
Sampling Team Leader _____
Affiliation _____
Address & Phone Number _____
Sampling Personnel _____
Field Oversight Personnel _____
Affiliation _____
Date(s) of Oversight _____

Checklist section(s) completed for this overview:

1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___

KEY:

- | | |
|----------------------------|--------------------------|
| 1 General Procedures | 2 Groundwater Sampling |
| 3 Soil & Sediment Sampling | 4 Surface Water Sampling |
| 5 Waste Sampling | 6 Storm Water Sampling |
| 7 Air Sampling | 8 Potable Water Sampling |

- 1) Type of samples collected? _____
2) Were sampling locations properly selected? Yes ___ No ___

Comments _____

Figure 6-1

3) Were sampling locations adequately documented in a bound field log book using indelible ink?
Yes ___ No ___

Comments _____

4) Were photos taken and photolog maintained? Yes ___ No ___

5) What field instruments were used during this study? _____

6) Were field instruments properly calibrated and calibrations recorded in a bound field log book?
Yes ___ No ___

Comments _____

7) Was sampling equipment properly wrapped and protected from possible contamination prior to sample collection? Yes ___ No ___

Comments _____

8) Was sampling equipment constructed of Teflon®, polyethylene, glass, or stainless steel?
Yes ___ No ___

Comments _____

9) Were samples collected in proper order? (least suspected contamination to most contaminated?) Yes ___ No ___

Comments _____

10) Were clean disposable latex or vinyl gloves worn during sampling? Yes ___ No ___

Comments _____

11) Were gloves changed before each sample? Yes ___ No ___

Comments _____

12) Was any equipment field cleaned? Yes ___ No ___

Comments _____

Figure 6-1 Continued

13) Type of equipment cleaned? _____

14) Were proper cleaning procedures used? Yes ___ No ___

Comments _____

15) Were equipment rinse blanks collected after field cleaning? Yes ___ No ___

Comments _____

16) Were proper sample containers used for samples? Yes ___ No ___

Comments _____

17) Were split samples offered to the regulatory agency representative? Yes ___ No ___

Comments _____

18) Was a receipt for samples form given to regulatory agency representative? Yes ___ No ___

Comments _____

19) Were any duplicate samples collected? Yes ___ No ___

Comments _____

20) Were samples properly field preserved? Yes ___ No ___

Comments _____

21) Were preservative blanks utilized? Yes ___ No ___

Comments _____

22) Were field and/or trip blanks utilized? Yes ___ No ___

Comments _____

23) Were samples adequately identified with labels or tags? Yes ___ No ___

Figure 6-1 Continued

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Comments _____

24) Were coolers sealed with custody seals after collection? Yes ___ No ___

Comments _____

25) What security measures were taken to insure custody of the samples after collection?
Yes ___ No ___

Comments _____

26) Were chain-of-custody and receipt for samples forms properly completed? Yes ___ No ___

Comments _____

27) Were any samples shipped to a laboratory? Yes ___ No ___

Comments _____

28) If yes to No. 27, were samples properly packed? Yes ___ No ___

Comments _____

29) What safety monitoring equipment, protection, and procedures were used prior to and during sampling? _____

30) Was safety monitoring equipment properly calibrated and were calibrations recorded in a bound field log book? Yes ___ No ___

Comments _____

Figure 6-1 Continued

Field Oversight Checklist - Groundwater Sampling

1) Type of wells sampled? (monitoring, potable, industrial, *etc.*) _____

2) Were wells locked and protected? Yes ___ No ___

Comments _____

3) Were identification marks and measurement points affixed to the wells? Yes ___ No ___

Comments _____

4) What were the sizes and construction materials of the well casings? _____

5) Were the boreholes sealed with a concrete pad to prevent surface infiltration? Yes ___ No ___

Comments _____

6) Was there a dedicated pump in the well? Yes ___ No ___

7) Was clean plastic sheeting placed around the wells to prevent contamination of sampling equipment and containers? Yes ___ No ___

8) Were total depth and depth to water determined before purging? Yes ___ No ___

9) What device was used to determine depth? _____

10) Were measurements made to the nearest 0.01 ft.? Yes ___ No ___

11) Was the measuring device properly cleaned between wells? Yes ___ No ___

Comments _____

12) Was the standing water volume in each well determined? Yes ___ No ___

13) How was the volume determined? _____

14) Was a sufficient volume purged prior to sampling? Yes ___ No ___

Figure 6-2

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Comments _____

15) What was done with the purged water? Was it collected for proper disposal, containerized until characterized or sent to an approved treatment facility? Yes ___ No ___

Comments _____

16) How many volumes? _____

17) How was the purged volume measured? _____

18) What was the method of purging? _____

19) Were pH, conductivity, temperature, turbidity, and dissolved oxygen measurements taken and recorded during well-purging activities? Yes ___ No ___

Comments _____

20) Were pH, conductivity, temperature, turbidity, and dissolved oxygen readings stable prior to sampling? Yes ___ No ___

Comments _____

21) How many wells were sampled? _____

Up gradient? _____ Down gradient? _____

Comments _____

22) How were the samples collected?

Bailer ___ Pump ___ Other _____

23) If pump was used, what type? _____

24) If a pump was used, was it properly cleaned before and/or between wells? Yes ___ No ___

Comments _____

25) What were the cleaning procedures? _____

Figure 6-2 Continued

26) Did bailers have polytetrafluoroethylene (PTFE)-coated wire leaders to prevent rope from coming into contact with water? Yes ___ No ___

27) Were bailers open or closed top? _____

28) Was a clean bailer and new leaders used at each well? Yes ___ No ___

Comments _____

29) Were samples properly transferred from the sampling device to the sample containers? (*i.e.*, purgeable sample first - not aerated, *etc.*) Yes ___ No ___

Comments _____

30) Was pH of preserved samples checked to insure proper preservation? Yes ___ No ___

Comments _____

31) Were samples iced immediately after collection? Yes ___ No ___

32) For what analyses were the samples collected? _____

-

33) If samples were split, what were the sample/station numbers for these? _____

34) Other comments or observations _____

Figure 6-2 Continued

Field Oversight Checklist - Soil and Sediment Sampling

- 1) Type of samples collected? _____
- 2) General description of samples? _____
- 3) How many samples were collected? _____
- 4) Were background and/or control samples collected? Yes ___ No ___

Comments _____

- 5) Were representative samples collected? Yes ___ No ___

Comments _____

- 6) Were grab or composite samples collected? _____
- 7) Were composite samples areal or vertical? _____
- 8) How many aliquots were taken for the composite sample? _____
- 9) What procedures and equipment were used to collect samples?

- 10) Were samples thoroughly mixed prior to putting them into the sample containers? Yes ___ No ___

Comments _____

- 11) Were samples properly placed into sample containers? Yes ___ No ___

Comments _____

- 12) Were samples chilled with water iced immediately after collection? Yes ___ No ___

- 13) For what analyses were the samples collected? _____

- 14) If samples were split, what were the sample/station numbers for these? ___

Figure 6-3

15) Was a drilling rig, back hoe, *etc.*, used to collect soil samples? Yes ___ No ___

Comments _____

16) What was done with the soil cuttings from the drill rig or back hoe? Were the cuttings collected for proper disposal, or containerized until characterized? Yes ___ No ___

Comments _____

17) Were the drilling rig, backhoe, *etc.*, properly cleaned prior to arriving on site? Yes ___ No ___

Comments _____

18) What was the condition of the drilling and sampling equipment when it arrived on site? (cleanliness, leaking jacks, peeling paint) _____

19) Was a decontamination area located where the cleaning activities would not cross-contaminate clean and/or drying equipment? Yes ___ No ___

Comments _____

20) Was clean equipment properly wrapped and stored in a clean area? Yes ___ No ___

Comments _____

21) Was the drilling rig(s) properly cleaned between well borings? Yes ___ No ___

Comments _____

22) Were the cleaning and decontamination procedures conducted in accordance with the project plans? Yes ___ No ___

Comments _____

23) Other comments or observations. _____

Figure 6-3 Continued

Field Oversight Checklist - Surface Water Sampling

1) Type of samples collected? _____

2) General description of samples? _____

3) How many samples were collected? _____

4) Were background and/or control samples collected? Yes ___ No ___

Comments _____

5) Were grab or composite samples collected? _____

6) How many aliquots were taken for the composite sample? ___

7) What procedures and equipment were used to collect the samples? _____

8) Were samples collected directly into sample containers? Yes ___ No ___

Comments _____

9) Did the sampler wade in the stream to collect the samples? Yes ___ No ___

Comments _____

10) Were the samples collected upstream from the sampler? Yes ___ No ___

Comments _____

11) Did the sampler insure that roiled sediments were not collected along with the water samples? Yes ___ No ___

Comments _____

12) Were representative samples collected? Yes ___ No ___

Comments _____

Figure 6-4

13) Was the pH of preserved samples checked to insure proper preservation? Yes ___ No ___

Comments _____

14) Were samples chilled with water iced immediately after collection? Yes ___ No ___

15) For what analyses were the samples collected? _____

16) If samples were split, what were the sample/station numbers for these?

17) Other comments or observations _____

Figure 6-4

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Field Oversight Checklist - Waste Sampling

- 1) Type of samples collected? (oil, sludge, waste, wipe, chip, sweep) _____

- 2) Description of containers or sources sampled? _____

- 3) How many samples were collected? _____
- 4) What type of equipment was used to collect the samples?

- 5) What procedures were used to collect the samples? _____

- 6) For what analyses were the samples collected? _____
- 7) If samples were split, what were the sample/station numbers for these? _____

- 8) Were any special safety measures taken during collection of the samples? _____

- 9) What level of safety protection was required for collection of the samples? _____

- 10) Other comments or observations _____

Figure 6-5

Field Oversight Checklist - Storm Water Sampling

- 1) Was outfall sampling point selection appropriate? Yes ___ No ___
- 2) Was visual monitoring conducted and recorded? Yes ___ No ___
- 3) Did the rainfall event produce a minimum of 0.1 inches of rain? Yes ___ No ___
- 4) Was the rainfall event preceded by a period of at least 72 hours during which no more than 0.1 inches of rain occurred? Yes ___ No ___
- 5) Was it a "normal" rainfall event (duration and total rainfall not more than 50% of the average storm event)? Yes ___ No ___
- 6) Was runoff produced? Yes ___ No ___
- 7) Types of samples collected? (grab, flow-weighted composite)

- 8) Were grab samples collected within the first 30 minutes after the on-set of runoff? Yes ___ No ___
- 9) If grab samples were not obtained during the first 30 minutes, were they at least collected within the first 60 minutes of discharge? Yes ___ No ___
- 10) What analytical procedures are going to be conducted on the grab samples? _____

- 11) Were flow-weighted samples properly prepared (even time intervals)? Yes ___ No ___
- 12) What was the time duration over which the composite samples were obtained? _____

- 13) Were composite samples composed of at least three discrete samples taken in each hour for the first three hours of discharge, or the entire storm if less than three hours in duration, with each sample being separated by minimum of 15 minutes? Yes ___ No ___
- 14) How was flow rate determined? _____

Figure 6-6

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15) How was rainfall amount determined? _____

16) What analytical procedures will be conducted on the flow-weighted composited samples? _____

17) What procedures and equipment were used to collect the samples? _____

18) Were representative samples collected? Yes ___ No ___

Comments _____

19) Was adequate information recorded to document the sampling event? Yes ___ No ___

20) Was the pH of preserved samples checked to insure proper preservation? Yes ___ No ___

Comments _____

21) Were samples chilled with water iced immediately after collection? Yes ___ No ___

22) If samples were split, what were the sample/station numbers for these? _____

23) Other comments or observations _____

Figure 6-6 Continued

Field Oversight Checklist - Air Sampling

- 1) Is there a list of the air monitoring and meteorological stations? Yes ___ No ___
- 2) Is there a map(s) showing the location of air monitoring and meteorological stations? Yes ___
No ___
- 3) Is there a Contingency Plan addressing sampling failures caused by unpredicted meteorological delays? Yes ___ No ___
- 4) Does the sampling network agree with the project plan? Yes ___ No ___

Comments _____

- 5) Are there planned or required QC/QA samples scheduled? Yes ___ No ___
- 6) What are the contaminants of concern? _____

- 7) Types of data collected? (particulate, gaseous, meteorological, *etc.*) _____

- 8) Are there project-specific SOPs for sampling? Yes ___ No ___
- 9) Are the correct methods being performed? Yes ___ No ___
- 10) Type(s) of air monitoring equipment used? _____
- 11) Number of air monitoring stations? _____
- 12) Is there a data recording, reporting, and required data CoC plan? Yes ___ No ___
- 13) Are the air monitoring instruments locked and protected? Yes ___ No ___
- 14) Are there air monitoring calibration SOPs? Yes ___ No ___
- 15) Are the air monitoring instruments calibrated? Yes ___ No ___

Comments _____

Figure 6-7

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16) Are calibration data and instrument serial numbers recorded in a log book? Yes ___ No ___

Comments _____

17) What meteorological data are being collected? _____

18) Number of meteorological stations? _____

19) Are the wind speed and direction sensors located at the recommended height in meters?

Yes ___ No ___

Comments _____

20) What is the duration for wind speed and direction readings? (2 hours, continuous) _____

21) Are the meteorological instruments calibrated? Yes ___ No ___

Comments _____

22) Are calibration data and instrument serial numbers recorded in a log book? Yes ___ No ___

Comments _____

23) Are any air monitoring or meteorological stations located where the data collected could be biased? Yes ___ No ___

Comments _____

24) Did the sampling time and total sample volume collected provide sufficient sample for analysis which meets the required detection limits? Yes ___ No ___

Figure 6-7 Continued

Field Oversight Checklist - Potable Water Sampling

1) Did the sampling team verify that the sample tap was not located after a household purification and/or conditioning system? Yes ___ No ___

2) Were name(s) of the resident or water-supply owner/operator, mailing address, and phone number obtained by the field sampling team? Yes ___ No ___

3) Was clean plastic sheeting placed around the sampling point to prevent contamination of sampling equipment and containers? Yes ___ No ___

4) What were the preparatory purging procedures? _____

5) Were aerator, strainer, and hose attachments removed from the tap prior to sampling? Yes ___ No ___

6) Were pH, specific conductance, and temperature readings stable prior to sampling? (pH \pm 0.2 units, specific conductance \pm 10%, temperature \pm 0.5• C) Yes ___ No ___

Comments _____

7) Were the samples collected directly into the sample container? Yes ___ No ___

8) Were clean gloves used for each sampling location? Yes ___ No ___

9) How many taps were sampled? _____

10) If dissolved metals are a parameter of concern, were the samples filtered in the field prior to preservation? Yes ___ No ___

11) Was pH of preserved samples checked to insure proper preservation, and was this check completed without contaminating the sample? (*i.e.* do not put pH test strip into sample container) Yes ___ No ___

Comments _____

12) Were samples iced immediately after collection? Yes ___ No ___

13) For what analyses were the samples collected? _____

Figure 6-8

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14) If samples were split, what were the sample/station numbers for these, making sure that they have been blind to the laboratory on the chain-of-custody form. _____

15) Other comments or observations _____

Figure 6-7 Continued